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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/586,530

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EXAMINER

AKRAM, IMRAN

ART UNIT

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1723

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/586,530	Applicant(s) UKAI ET AL.	
	Examiner IMRAN AKRAM	Art Unit 1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 December 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-23,25-31 and 33-36 is/are pending in the application.
- 4a) Of the above claim(s) 1 and 4-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-23,25-31 and 33-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/3/10 have been fully considered but they are not persuasive. The reference rejections still apply, albeit in modified form as necessitated by amendment.
2. Applicant asserts on page 19 of the Arguments that the Maenishi does not disclose each element of the claim; namely, that the Maenishi reference "does not disclose counting the number of times in which the hydrogen generator is started up and/or stopped and then increasing reformed gas temperature in the shift converter." Examiner respectfully disagrees. As stated in the rejection below, the Maenishi reference discloses starting and stopping the combustor according to the reforming temperature in paragraph 104. Specifically, Maenishi discloses correlating the temperature of the reformer to the number of starts and stops of the combustor, which is part of the hydrogen generator apparatus.
3. Applicant asserts on pages 19-20 that the combustor is started and stopped only at start-up so the reformat temperature is unaffected. Examiner respectfully disagrees. Clearly, by starting and stopping the combustor, which is part of the hydrogen generator, the reformer temperature is affected directly. This, in turn, affects the reformat temperature entering the shift unit. In fact, the Maenishi reference discloses (in paragraph 104) that the reformer catalyst temperature data is stored during the reformation process and that data is used to calculate the number of times of start and stop of the hydrogen generator.

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4. Applicant asserts on page 20 that the Taguchi reference does not disclose every element of the claims; namely, that Taguchi does not disclose increasing the reformed gas temperature based on the number of times of start and stop. Examiner respectfully disagrees. Taguchi clearly states in paragraph 132 that the number of times of start and stop are directly correlated to the reformer temperature.

5. Applicant asserts on pages 20-21 that the Ukai reference does not disclose every element of the claims; namely, that Ukai does not disclose increasing the reformed gas temperature based on the number of times of start and stop. Examiner respectfully disagrees. Ukai clearly states counting the number of times of start and stop (paragraph 139) and that the number of times of start and stop are directly correlated to the reformer temperature (paragraph 18).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 21, 22, 29, and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Maenishi (US 2005/0129997 A1).

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8. Regarding claim 21, Maenishi discloses a process comprising: including a steam reformer with a material supply, water supply (paragraph 2), and shift reactor (paragraph 135); counting the number of times the reformer starts and/or stops (paragraph 104); and increasing the temperature based on the number of starts and/or stops (paragraph 104).

9. Regarding claim 29, Maenishi discloses a process comprising: including a steam reformer with a material supply, water supply (paragraph 2), shift reactor (paragraph 135), and fuel cell (paragraph 39); counting the number of times the reformer starts and/or stops (paragraph 104); and increasing the temperature based on the number of starts and/or stops (paragraph 104).

10. Regarding claims 22 and 30, Maenishi discloses a temperature adjustment means and increasing the temperature based on the number of times of start and/or stop (paragraph 104).

11. Claims 21, 22, 26, 27, 29, 30, 34, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Taguchi (US 2003/0175562 A1).

12. Regarding claim 21, Taguchi discloses a process comprising: including a steam reformer with a material supply and water supply (paragraph 213) and shift reactor (paragraph 17); counting the number of times the reformer starts and/or stops (paragraph 76); and increasing the temperature based on the number of starts and/or stops (paragraph 132).

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13. Regarding claim 29, Taguchi discloses a process comprising: including a steam reformer with a material supply and water supply (paragraph 213), shift reactor (paragraph 17), and fuel cell (paragraph 1); counting the number of times the reformer starts and/or stops (paragraph 76); and increasing the temperature based on the number of starts and/or stops (paragraph 132).

14. Regarding claims 22 and 30, Taguchi discloses a temperature adjustment means and increasing the temperature of the reformed gas (paragraph 10).

15. Regarding claims 26 and 34, Taguchi discloses counting the number of times of start and/or stop and increasing the temperature of the system based on this (paragraph 123). It is necessary in Taguchi that the number of times of start and stop be output in some manner for the device to operate.

16. Regarding claims 27 and 35, Taguchi discloses counting the number of times of start and/or stop and increasing the temperature of the system based on this (paragraph 123) and increasing the temperature of the reformer based on time accumulated (paragraph 52).

17. Claims 21-23 and 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Ukai (US 2001/0002248 A1).

18. Regarding claim 21, Ukai discloses a process comprising: including a steam reformer with a material supply, water supply, and shift reactor (paragraph 47); counting the number of times the reformer starts and/or stops (paragraph 139); and increasing the temperature based on the number of starts and/or stops (paragraph 18).

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19. Regarding claim 29, Ukai discloses a process comprising: including a steam reformer with a material supply, water supply, and shift reactor (paragraph 47) and fuel cell (paragraph 2); counting the number of times the reformer starts and/or stops (paragraph 139); and increasing the temperature based on the number of starts and/or stops (paragraph 18).

20. Regarding claims 22 and 30, Ukai discloses a temperature adjustment means and increasing the temperature of the reformed gas (paragraph 18).

21. Regarding claims 23 and 31, Ukai discloses increasing the s/c ratio of the reformed gas by modifying the water supply and material feed supply (paragraph 82).

Claim Rejections - 35 USC § 103

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

23. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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24. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

25. Claims 25, 28, 33, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ukai as applied to claims 21 and 29, respectively.

26. Regarding claims 25 and 33, Ukai discloses an air source for the shifted reformat (paragraph 95) and a CO selective oxidation (purifier) unit (paragraph 12), further comprising the steps of: measuring controlled temperature data and corresponding it to the number of times of start and/or stop and CO concentration (paragraph 185); selecting the temperature based on the number of starts and/or stops and consequently choosing the CO concentration based on this temperature (paragraph 185); and modifying the air flow rate to the reformer based on a temperature detector of the reformer (paragraph 53). Ukai discloses increasing the S/C ratio of the reformed gas (paragraph 82), but not that this increase is based upon the number of times of start/stop or the accumulated process time. Ukai does, however, disclose that the CO concentration of the shift effluent increases with start and stop of the reformer

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(paragraph 139) and that an increase in S/C ratio decreases the CO concentration (paragraph 82). Carbon monoxide is a well-known catalyst poison and should be minimized (paragraph 8). It should have been obvious to one having ordinary skill in the art at the time of invention to increase the S/C ratio as done in Ukai when the apparatus is started and/or stopped over a period of time to minimize the CO formed as suggested in Ukai.

27. Regarding claims 28 and 36, Ukai discloses increasing the S/C ratio of the reformed gas (paragraph 82), but not that this increase is based upon the number of times of start/stop or the accumulated process time. The measurement of time is inherent to Ukai, as it is any process in which time is being taken into account. Ukai does, however, disclose that the CO concentration of the shift effluent increases with start and stop of the reformer (paragraph 139) and that an increase in S/C ratio decreases the CO concentration (paragraph 82). Carbon monoxide is a well-known catalyst poison and should be minimized (paragraph 8). It should have been obvious to one having ordinary skill in the art at the time of invention to increase the S/C ratio as done in Ukai when the apparatus is started and/or stopped over a period of time to minimize the CO formed as suggested in Ukai.

Conclusion

28. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IMRAN AKRAM whose telephone number is (571)270-3241. The examiner can normally be reached on 10-7 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/I. A./

Examiner, Art Unit 1723

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1723